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SECTION 13401
FLOW MEASUREMENT EQUIPMENT

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FLOW MEASUREMENT EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

Furnish and install magnetic flow meters for the purpose of measuring flow at specified locations.

1.2 RELATED WORK

Provide installation, enclosure and electrical service as required in contract documents.

1.3 TOOLS AND TEST EQUIPMENT

A. Test equipment shall be provided, together with items such as instruction manuals, carrying/ storage cases, unit battery charger where applicable, special tools, calibration fixtures, cord extenders, patch cords, and test leads, which are not specified but are necessary for checking field operation of equipment supplied under this Section.

B. Four (4) complete sets of Operation and Maintenance Manuals shall be provided.

1.4 SPARE PARTS

A. Miscellaneous Spare Parts:

1. One (1) year supply of the manufacturer's recommended spare parts for the equipment furnished.

2. The spares listed above shall be packed in a manner suitable for long-term storage and shall be adequately protected against corrosion, humidity and temperature.

1.5 EQUIPMENT MANUFACTURER

A. Approved manufactures for flow metering equipment are as follows:

1. Siemens/Danfoss

2. Or Equal

PART 2 – PRODUCTS

2.1 METER

A. The flowmeter shall be of the magnetic type and provide for transmitting of flow in full pipes. The flowmeter shall be obstructionless and installed between two pipe flanges having the same nominal diameter as the flowmeter end connections. The flowmeter shall operate by means of pulsed D.C. coil excitation and shall not require zero reset. The flow tube shall be constructed of type 304 stainless steel, the liner shall be Neoprene and the sensor electrodes and grounding electrodes shall be stainless steel type 316. Flowtube end connection shall be 150# ANSI steel flanges. The flowtube shall be able to withstand up to 30 feet submersion for 20 years.

B. The external surface of the sensor shall be protected by corrosion resistant two component paint. The sensor shall be pressure tested to 2.5 times the nominal pressure. The sensor shall be manufactured by an ISO 9001 approved company and shall be Siemens/Danfoss Model MAG 3100 or equal. Sensor shall be supplied with appropriate length of signal cable.

C. If a grounding ring is required, it shall be 316 stainless steel and installed at the inlet flange to assure potential equalization.

2.2 SIGNAL CONVERTER/INDICATOR AND TOTALIZER

A. The converter shall be suitable for remotely mounting up to 1,000 feet from the sensor. The converter shall be supplied with 110 VAC, 60 hertz power and the power consumption shall be 10 VA or less.

B. The converter shall provide a 4-20 mA isolated output proportional to flow. In addition a frequency/pulse output and a relay output shall be provided by the converter. The frequency output shall be proportional to flow rate and shall be capable of being scaled from 0-10 kilo-hertz. The pulse output shall be capable of being scaled for remote totalization.

C. The converter shall have an LCD display showing actual flow in GPM and totalized flow in Gallons. The LCD display shall have at least 2 x 16 alphanumeric digits and be backlit. The units shall be field programmable and configurable. The units are to be field full scale configurable (exchange from 150 full scale to 300 full scale). The keyboard and display shall be rotatable so that the flow rate and totalized flow can be seen

independent of sensor orientation. The converter shall be suitable for bi-directional flow, reading flow rate in both forward and reverse directions and containing two internal counters for totalized flow in both directions.

D. The converter shall be provided with an automatic zero point setting, an auto-range function and an empty pipe cut-off.

E. The converter shall be capable of detecting the following fault conditions:

1. Loss of current to the coil circuit
2. Loss of load on the current output
3. Empty pipe.

F. The converter shall be provided with an error log where all fault conditions occurring within 180-day period are stored.

G. The converter shall be a plug-in module, immediately replaceable without the need of disconnecting cables or recalibration.

H. The signal converter shall be manufactured by an ISO 9001 approved company.

I. The flow accuracy on the electronics of the magnetic meter shall be within 0.25% of reading flow accuracy of 0.10% of rate. The magnetic flowmeter shall be Siemens/Danfoss Model MAG 3100/6000 or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. All components shall be located, (minimum runs of straight pipe upstream and downstream, full pipe flow conditions, etc.), installed and tested in accordance with the manufacturer's written instructions.

3.2 WARRANTY

A. All components shall be warranted one year from the final acceptance of the system.

END OF SECTION 13401